

DIALINDEX(R)

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*** DIALINDEX search results display in an abbreviated ***

*** format unless you enter the SET DETAIL ON command. ***

You have 70 files in your file list.

(To see banners, use SHOW FILES command)

?

PLEASE ENTER A COMMAND OR BE LOGGED OFF IN 5 MINUTES

?s ((tantalum or ditantalum) (w) (oxide or pentaoxide or pentoxide) or Ta(2w)2(w)O(2w)5

Your SELECT statement is:

s ((tantalum or ditantalum) (w) (oxide or pentaoxide or pentoxide) or
Ta(2w)2(w)O(2w)5

Items	File
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>>>Unmatched parentheses

?s ((tantalum or ditantalum) (w) (oxide or pentaoxide or pentoxide) or Ta(2w)2(w)O(2w)5
and (wet or water or moisture or pyrogenic) (10n) (oxidis? or oxidiz? or oxidation or anneal?)

Your SELECT statement is:

s ((tantalum or ditantalum) (w) (oxide or pentaoxide or pentoxide) or
Ta(2w)2(w)O(2w)5) and (wet or water or moisture or pyrogenic) (10n) (oxidis?
or oxidiz? or oxidation or anneal?)

Items	File
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7	2: INSPEC 1969-2002/Jul W4
1	6: NTIS_1964-2002/Aug W2
4	8: Ei Compendex(R)_1970-2002/Jul W4
1	34: SciSearch(R) Cited Ref Sci_1990-2002/Aug W1
5	103: Energy SciTec_1974-2002/Jul B1
5	144: Pascal_1973-2002/Jul W4
1	315: ChemEng & Biotech Abs_1970-2002/Jun

Examined 50 files

Status: Break Sent.

?b 2,8,144

01aug02 13:24:34 User264704 Session D133.2

\$9.12 5.210 DialUnits File411

\$9.12 Estimated cost File411

\$2.38 TELNET

\$11.50 Estimated cost this search

\$11.54 Estimated total session cost 5.364 DialUnits

SYSTEM:OS - DIALOG OneSearch

File 2:INSPEC 1969-2002/Jul W4

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***File 2: Alert feature enhanced for multiple files, duplicates**
removal, customized scheduling. See HELP ALERT.

File 8:Ei Compendex(R) 1970-2002/Jul W4

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***File 8: Alert feature enhanced for multiple files, duplicates**
removal, customized scheduling. See HELP ALERT.

File 144:Pascal 1973-2002/Jul W4

(c) 2002 INIST/CNRS

Set	Items	Description
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?s ((tantalum or ditantalum) (w) (oxide or pentaoxide or pentoxide) or Ta(2w)2(w)O(2w)5
and (wet or water or moisture or pyrogenic) (10n) (oxidis? or oxidiz? or oxidation or anneal?)

Processing

35327 TANTALUM
 29 DITANTALUM
 441766 OXIDE
 177 PENTAOXIDE
 3199 PENTOXIDE
 2272 (TANTALUM OR DITANTALUM) (W) ((OXIDE OR PENTAOXIDE) OR
 PENTOXIDE)
 48036 TA
 5245408 2
 1271635 O
 2682417 5
 3974 TA(2W)2(W)O(2W)5
 72180 WET
 1167273 WATER
 82176 MOISTURE
 1033 PYROGENIC
 7366 OXIDIS?
 74121 OXIDIZ?
 297030 OXIDATION
 270560 ANNEAL?
 20387 (((WET OR WATER) OR MOISTURE) OR
 PYROGENIC) (10N) (((OXIDIS? OR OXIDIZ?) OR OXIDATION) OR
 ANNEAL?)
 S1 16 ((TANTALUM OR DITANTALUM) (W) (OXIDE OR PENTAOXIDE OR
 PENTOXIDE) OR TA(2W)2(W)O(2W)5) AND (WET OR WATER OR
 MOISTURE OR PYROGENIC) (10N) (OXIDIS? OR OXIDIZ? OR
 OXIDATION OR ANNEAL?)

?rd

...completed examining records

S2 14 RD (unique items)

?t s2/full/all

2/9/1 (Item 1 from file: 2)

DIALOG(R)File 2:INSPEC

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6838034 INSPEC Abstract Number: A2001-06-6320D-002

Title: Ta-O phonon peaks in tantalum oxide films on Si

Author(s): Ono, H.; Hosokawa, Y.; Shinoda, K.; Koyanagi, K.; Yamaguchi, H.

Author Affiliation: Silicon Syst. Res. Lab., NEC Corp., Tsukuba, Japan

Journal: Thin Solid Films vol.381, no.1 p.57-61

Publisher: Elsevier,

Publication Date: 2 Jan. 2001 **Country of Publication:** Switzerland

CODEN: THSFAP **ISSN:** 0040-6090

SICI: 0040-6090(20010102)381:1L:57:PPTO;1-4

Material Identity Number: T070-2001-004

U.S. Copyright Clearance Center Code: 0040-6090/2001/\$20.00

Document Number: S0040-6090(00)01550-9

Language: English **Document Type:** Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Ta /sub 2 / o /sub 5 / films, 10 and 100 nm in thickness, directly deposited on a Si substrate were investigated by using transmission Fourier-transform infrared spectroscopy. The samples were annealed in dry oxygen, wet oxygen and nitrogen atmospheres. The Ta-O phonon peaks in the infrared absorption spectra appeared at 210, 510 and 570 cm/sup -1/ in samples that were annealed at 700 and 800 degrees C for up to 4 h. We found that the 510/570 cm/sup -1/ peak height ratio is larger for thicker Ta /sub 2 / o /sub 5 / films annealed at higher temperatures. This implies that peak height ratios are directly related to Ta /sub 2 / o /sub 5 / film quality, and we conclude that stronger lattice structures can be formed by annealing at higher temperatures. (18 Refs)

Subfile: A

Descriptors: annealing; Fourier transform spectra; infrared spectra; insulating thin films; light transmission; phonon spectra; tantalum compounds

Identifiers: Ta-O phonon peaks; tantalum oxide film Si; Ta /sub 2 / O /sub 5 / films; transmission Fourier-transform infrared spectroscopy; annealed film; dry oxygen; wet oxygen; nitrogen atmosphere; infrared absorption spectra; peak height ratios; Ta /sub 2 / O /sub 5 / film quality; lattice structures; annealing; 10 nm; 100 nm; 210 to 570 cm/sup -1/; 800 C; 4 h; 700 C; Ta /sub 2 / O /sub 5 /; O/sub 2/; N/sub 2

Class Codes: A6320D (Phonon states and bands, normal modes, and phonon dispersion); A6860 (Physical properties of thin films, nonelectronic); A7865P (Optical properties of other inorganic semiconductors and insulators (thin films/low-dimensional structures)); A7830G (Infrared and Raman spectra in inorganic crystals); A8140G (Other heat and thermomechanical treatments)

Chemical Indexing:

Si sur - Si el (Elements - 1)

Ta2O5 bin - Ta2 bin - O5 bin - Ta bin - O bin (Elements - 2)

O2 el - O el (Elements - 1)

N2 el - N el (Elements - 1)

Numerical Indexing: size 1.0E-08 m; size 1.0E-07 m; wavelength 1.8E-05 to 4.8E-05 m; temperature 1.07E+03 K; time 1.4E+04 s; temperature 9.73E+02 K

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2/9/2 (Item 2 from file: 2)

DIALOG(R) File 2:INSPEC

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4881176 INSPEC Abstract Number: B9503-0170J-071

Title: Factors affecting metal/polymer interface durability in microelectronics packaging: Chemistry and water uptake

Author(s): Clearfield, H.M.; Furman, B.K.; Callegari, A.; Graham, T.; Purushothaman, S.

Author Affiliation: IBM FSC Microelectronics, Hopewell Junction, NY, USA p.321-31

Editor(s): Borgesen, P.; Jensen, K.F.; Pollak, R.A.

Publisher: Mater. Res. Soc, Pittsburgh, PA, USA

Publication Date: 1994 Country of Publication: USA xiii+450 pp.

Conference Title: Electronic packaging materials science VII

Conference Date: 29 Nov.-3 Dec. 1993 Conference Location: Boston, MA, USA

Language: English Document Type: Conference Paper (PA)

Treatment: Practical (P); Experimental (X)

Abstract: We report on the durability of interfaces formed between reactive metals and polyimides (PI) subjected to environment simulation stresses. PI surfaces were treated by Ar RF plasmas prior to metal deposition, and durability was determined by measuring 90 degree peel strength as a function of environmental exposure. Cr and Ti/PMDA-ODA interface processing stress durability depends on PI surface modification and metal reactivity. For both, we observed interfacial degradation due to metal oxidation caused by PI water absorption. These studies, coupled with water transport measurements, suggest that interface physical structure is the dominant factor. To determine service environmental stress durability, we correlated peel strengths with interfacial chemistry and water uptake. In this case, Ar and O/sub 2/ plasmas were used. For Ta/BPDA-PDA, durability depends on plasma treatment type. Ar-treated specimens maintain strength through 500 hours T/H stressing whereas those treated by O/sub 2/ plasma fail at 165 hours. The difference here can be explained by interfacial chemistry - Ta/Ar-etched surfaces form a stable TaC-like structure whereas Ta/O/sub 2/-etched surfaces form a metastable sub-oxide structure that transforms to Ta /sub 2 / O /sub 5 / during stressing. Ta/PMDA-ODA interfaces fail readily under these conditions due to increased PI water uptake. (18 Refs)

Subfile: B

Descriptors: environmental stress screening; integrated circuit packaging; integrated circuit reliability; interface structure; mechanical testing; multichip modules; oxidation; polymer films; sorption; surface chemistry; surface treatment; thermal stresses; water

Identifiers: metal/polymer interface durability; microelectronics

packaging; interfacial chemistry; water uptake; reliability service
environmental stress durability; interface processing stress durability;
reactive metals; polyimides; environment simulation stresses; Ar RF plasmas
; metal deposition; peel strength; Ti/PMDA-ODA interface; Cr/PMDA-ODA
interface; O/sub 2/ plasma; metal reactivity; interfacial degradation;
metal oxidation; PI water absorption; Ta/BPDA-PDA interface; interface
physical structure; 500 hr; 165 hr; Cr; Ti; Ta; Ta /sub 2 / O /sub 5 /;
Ar; O/sub 2/; H/sub 2/O

Class Codes: B0170J (Product packaging); B0170N (Reliability); B0560 (Polymers and plastics (engineering materials science)); B2250 (Multichip modules); B0590 (Materials testing); B0170E (Production facilities and engineering); B0530 (Metals and alloys (engineering materials science))

Chemical Indexing:

Cr int - Cr el (Elements - 1)

Ti int - Ti el (Elements - 1)

Ta int - Ta el (Elements - 1)

Ta2O5 int - Ta2 int - O5 int - Ta int - O int - Ta2O5 bin - Ta2 bin - O5 bin - Ta bin - O bin (Elements - 2)

Ar el (Elements - 1)

O2 el - O el (Elements - 1)

H2O bin - H2 bin - H bin - O bin (Elements - 2)

Numerical Indexing: time 1.8E+06 s; time 5.94E+05 s

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2/9/3 (Item 3 from file: 2)

DIALOG(R) File 2:INSPEC

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03355675 INSPEC Abstract Number: A89048636, B89030144

Title: Interfacial oxidation of silicon substrates through Ta /sub 2 / O /sub 5 / films

Author(s): Kato, T.; Ito, T.

Author Affiliation: Fujitsu Labs. Ltd., Atsugi, Japan

Journal: Journal of the Electrochemical Society vol.135, no.10 p. 2586-90

Publication Date: Oct. 1988 Country of Publication: USA

CODEN: JESOAN ISSN: 0013-4651

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: The authors observed the oxidation of a silicon substrate covered with thermally grown **tantalum oxide** films during exposure to a high-temperature oxidizing ambient. It was found that the oxidation rate of a silicon substrate covered with Ta /sub 2 / O /sub 5 / greatly depended on the **oxidizing** ambient. In a **wet** oxygen ambient, the **oxidation** rate was equal to that of bare silicon. However, the rate became very small in a dry oxygen ambient. They believe that these results can be attributed to the differences between the species that diffuse through the Ta /sub 2 / O /sub 5 /, resulting in a diffusion coefficient over 4000 times larger in wet oxygen than that in dry oxygen at 1000 degrees C. The silicon oxide grown at the interface is stoichiometric silicon dioxide and the transitions between the Ta /sub 2 / O /sub 5 //SiO/sub 2//Si layers are very abrupt. (21 Refs)

Subfile: A B

Descriptors: oxidation; semiconductor-insulator boundaries; silicon; surface diffusion; tantalum compounds

Identifiers: interfacial oxidation; semiconductor; diffusion coefficient; Ta /sub 2 / O /sub 5 /-Si; Ta /sub 2 / O /sub 5 /-SiO/sub 2/-Si; Si

Class Codes: A6822 (Surface diffusion, segregation and interfacial compound formation); A8160C (Semiconductors); B2550E (Surface treatment and oxide film formation); B2530F (Metal-insulator-semiconductor structures)

Chemical Indexing:

Ta2O5-Si int - Ta2O5 int - Ta2 int - O5 int - Si int - Ta int - O int - Ta2O5 bin - Ta2 bin - O5 bin - Ta bin - O bin - Si el (Elements - 2,1,3)

Ta2O5-SiO2-Si int - Ta2O5 int - SiO2 int - Ta2 int - O2 int - O5 int - Si int - Ta int - O int - Ta2O5 bin - SiO2 bin - Ta2 bin - O2 bin - O5 bin - Si bin - Ta bin - O bin - Si el (Elements - 2,2,1,3)

2/9/4 (Item 4 from file: 2)

DIALOG(R)File 2:INSPEC

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03111762 INSPEC Abstract Number: A88057887

Title: Determination of ^{18}O by prompt nuclear reaction analysis: application for measurement of microsamples

Author(s): Bradshaw, S.D.; Cohen, D.; Katsaros, A.; Tom, J.; Owen, F.J.

Author Affiliation: Dept. of Zoology, Western Australia Univ., Perth, WA, Australia

Journal: Journal of Applied Physiology vol.63, no.3 p.1296-1302

Publication Date: Sept. 1987 **Country of Publication:** USA

CODEN: JAPYAA **ISSN:** 0161-7567

U.S. Copyright Clearance Center Code: 0161-7567/87/\$1.50

Language: English **Document Type:** Journal Paper (JP)

Treatment: Practical (P)

Abstract: A method is described for the routine determination of ^{18}O concentrations in microsamples of biological fluids. The method utilizes the prompt nuclear reaction $^{18}\text{O}(\text{p}, \alpha)^{15}\text{N}$, and 846-keV protons from a 3-MeV Van de Graaff Accelerator are focused on approximately 2000-Å-thick Ta_2O_5 targets prepared by anodic oxidation from 50- μl samples of water distilled from blood or other biological fluids. The broad cross section of the resonance peak for this nuclear reaction (47 keV) ensures high yields, especially at small reaction angles, and the high-energy alpha particles produced by the reaction (4 MeV) are readily separated from scattered protons by the use of an aluminized Mylar foil of suitable thickness. Background levels of ^{18}O (0.204 atom%) can be detected with run times of approximately 5-8 min, and the sensitivity of the method is the order of 0.05 atom%. Experimental error due to sample preparation was found to be 1.7%, and counting errors were close to theoretical limits so that total error was of the order of 2.5%. (24 Refs)

Subfile: A

Descriptors: biological techniques and instruments; chemical analysis by nuclear reactions and scattering; oxygen

Identifiers: experimental error; field metabolic rate; blood; biological fluids; aluminized Mylar foil; counting errors; 846 keV; 47 keV; 3 MeV; 4 MeV; Ta_2O_5

Class Codes: A8280H (Radiochemical activation analysis methods); A8780 (Biophysical instrumentation and techniques)

Chemical Indexing:

Ta205 bin - Ta2 bin - O5 bin - Ta bin - O bin (Elements - 2)

Numerical Indexing: electron volt energy 8.46E+05 eV; electron volt energy 4.7E+04 eV; electron volt energy 3.0E+06 eV; electron volt energy 4.0E+06 eV

2/9/5 (Item 5 from file: 2)

DIALOG(R)File 2:INSPEC

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02672709 INSPEC Abstract Number: A86064728, B86035450

Title: Oxidation temperature dependence of the DC electrical conduction characteristics and dielectric strength of thin Ta_2O_5 films on silicon

Author(s): Oehrlein, G.S.

Author Affiliation: IBM Thomas J. Watson Res. Center, Yorktown Heights, NY, USA

Journal: Journal of Applied Physics vol.59, no.5 p.1587-95

Publication Date: 1 March 1986 **Country of Publication:** USA

CODEN: JAPIAU **ISSN:** 0021-8979

U.S. Copyright Clearance Center Code: 0021-8979/86/051587-09\$02.40

Language: English **Document Type:** Journal Paper (JP)

Treatment: Experimental (X)

Abstract: **Tantalum pentoxide** thin films (60-80 nm thick) on silicon were prepared by thermal oxidation at 430-675 degrees C of electron-beam evaporated Ta. The tantalum layers had been deposited by electron-beam evaporation onto the Si substrates held at room temperature (RT) or heated to 150 degrees C during Ta evaporation. The DC conduction properties and the dielectric strength of the $\text{Ta}/\text{O}/\text{Si}$ films were studied employing $\text{Al}/\text{Ta}/\text{O}/\text{Si}$ capacitors. The smallest conductivity was found for $\text{Ta}/\text{O}/\text{Si}$ films formed from Ta deposited onto Si held at RT during evaporation and oxidized at 490 degrees C for 1 h in dry O_2 . This minimum conductivity corresponds to a leakage current of 1×10^{-7} A/cm² at an applied field of 1 MV/cm (Al negative on p-type Si substrates). The DC conduction characteristics can be interpreted by assuming Poole-Frenkel conduction. For $\text{Ta}/\text{O}/\text{Si}$ formed from Ta which had been deposited onto Si substrates held at 150 degrees C during evaporation, the conductivity is smallest for a film which had been oxidized at 430 degrees C for 1 h (lowest oxidation temperature investigated). $\text{Ta}/\text{O}/\text{Si}$ films formed from Ta deposited onto Si substrates at RT exhibit lower conductivity than $\text{Ta}/\text{O}/\text{Si}$ films formed from Ta deposited onto heated (150 degrees C) Si substrates for a given oxidation temperature. The presence of water in the oxidizing ambient was found to greatly deteriorate the leakage characteristics of the $\text{Ta}/\text{O}/\text{Si}$ films. The dielectric strength of the $\text{Ta}/\text{O}/\text{Si}$ film for which the lowest conductivity was observed (oxidized at 490 degrees C) ranged from 2 to 4.5 MV/cm. A maximum in the breakdown distribution was found for a breakdown strength of 3-3.5 MV/cm. (25 Refs)

Subfile: A B

Descriptors: dielectric thin films; electric strength; electron beam deposition; elemental semiconductors; oxidation; semiconductor-insulator boundaries; silicon; tantalum compounds

Identifiers: oxidation temperature dependence; DC electrical conduction; dielectric strength; thin $\text{Ta}/\text{O}/\text{Si}$ films; thermal oxidation; electron-beam evaporation; Si substrates; $\text{Al}/\text{Ta}/\text{O}/\text{Si}$ capacitors; minimum conductivity; leakage current; Poole-Frenkel conduction

Class Codes: A7340Q (Metal-insulator-semiconductor structures); A7360H (Insulating thin films); A7750 (Dielectric breakdown and space-charge effects); A7755 (Dielectric thin films); A8115G (Vacuum deposition); A8160 (Corrosion, oxidation, etching, and other surface treatments); B2530F (Metal-insulator-semiconductor structures)

2/9/6 (Item 6 from file: 2)

DIALOG(R) File 2:INSPEC

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00380339 INSPEC Abstract Number: A72032385

Title: A kinetic study of the initial oxidation of a Ta(110) surface using oxygen K/α / X-ray emission

Author(s): Sewell, P.B.; Mitchell, D.F.; Cohen, M.

Author Affiliation: Nat. Res. Council Canada, Ottawa, Ont., Canada

Journal: Surface Science vol.29, no.1 p.173-88

Publication Date: Jan. 1972 Country of Publication: Netherlands

CODEN: SUSCAS ISSN: 0039-6028

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: The application of reflection high-energy electron diffraction (RHEED) and electron excited X-ray emission to the study of the initial stages of oxidation of the Ta(110) surface is demonstrated. Oxidation in both dry oxygen and water vapour is investigated over a temperature range of 25-275 degrees C and a pressure range of 10^{-7} to 1 torr. In dry oxygen the thickness (y) of the uniform amorphous state is a function of the oxygen exposure in langmuirs (L) and its growth can be described by the logarithmic relation $y = k_1 / \log(L + L_0)$; k_2 , where $k_1 = 1.09 \pm 0.07 \times 10^{-8}$ g/cm², $k_2 = 1.3 \pm 0.3 \times 10^{-8}$ g/cm² and $L_0 = 1L$. The growth of oxides up to 8 AA was observed with dry oxygen exposures of about 10^9 L. Thicker films grow in the

presence of water vapour and films formed after chemical polishing and short periods of atmospheric exposure were found to be 35±5 AA mean thickness. Problems associated with the preparation of the Ta(110) surface in a 'clean' starting condition are discussed. (16 Refs)

Subfile: A

Descriptors: films; oxidation; reaction kinetics; tantalum; tantalum compounds; X-ray emission spectra

Identifiers: kinetic study; initial oxidation; Ta(110) surface; O X-ray emission; RHEED; electron excited X-ray emission; oxide layer thickness; oxygen exposure dependence; Ta /sub 2 / O /sub 5 / thin film; dry oxygen ; water vapour

Class Codes: A7360 (Electronic properties of thin films); A8160 (Corrosion, oxidation, etching, and other surface treatments)

2/9/7 (Item 7 from file: 2)

DIALOG(R) File 2:INSPEC

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00292152 INSPEC Abstract Number: A71057619

Title: The use of the $\text{O}(p, \alpha)$ N nuclear reaction in the study of the oxidation of metals

Author(s): Skakun, N.A.; Klyuchabev, A.P.; Khar'kov, O.N.; Zelenskii, V.F.; Kulakov, V.S.

Journal: Atomnaya Energiya vol.30, no.5 p.456-8

Publication Date: May 1971 Country of Publication: USSR

CODEN: AENGAB ISSN: 0004-7163

Translated in: Soviet Atomic Energy

Country of Publication: USA

CODEN: SATEAZ ISSN: 0038-531X

Language: Russian Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: The authors describe the advantages of non-destructive radioactive analysis, in particular the use of alpha -particle bombardment for the study of samples containing $\text{O}/\text{sup } 18/$. They describe the preparation of a standard tantalum pentoxide target with uniform $\text{O}/\text{sup } 18/$ contents with respect to depth. Using this standard they evolve a method of oxygen determination at surfaces and study the oxidation of zirconia in water vapour. They recommend the technique for the study of reactions involving oxygen and solids in general.

Subfile: A

Descriptors: alpha-particle effects; nuclear reactions and scattering due to protons; oxidation; oxygen

Identifiers: zirconia oxidation; water vapour; radioactive analysis; alpha- particle bombardment; standard tantalum pentoxide target; uniform $\text{O}/\text{sup } 18/$ content

Class Codes: A2540 (Nucleon-induced reactions and scattering); A8160 (Corrosion, oxidation, etching, and other surface treatments)

2/9/8 (Item 1 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)

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05843612 E.I. No: EIP01266559721

Title: Electrical characteristics of $\text{TaO}/\text{xN}/\text{y}$ for high-k MOS gate dielectric applications

Author: Im, K.; Jung, H.; Jeon, S.; Yang, D.; Hwang, H.

Corporate Source: Dept. of Materials Sci. and Eng. Kwangju Inst. of Sci. and Technology, Puk-gu, Kwangju 500-712, South Korea

Conference Title: Gate Stack and Silicide Issues in Silicon Processing

Conference Location: San Francisco, CA, United States Conference Date: 20000425-20000427

E.I. Conference No.: 58144

Source: Materials Research Society Symposium - Proceedings v 611 2001. p C181-C186

Publication Year: 2001

CODEN: MRSPDH ISSN: 02-9172

Language: English

Document Type: CA; (Conference Article) Treatment: A; (Applications); T; (Theoretical)

Journal Announcement: 0107W1

Abstract: In this paper, we report a process for the preparation of high quality amorphous tantalum oxynitride (TaO//xN//y) via ammonia annealing of Ta//20//5 followed by wet reoxidation for use in gate dielectric applications. Compared with tantalum oxide (Ta//20//5), a significant improvement in the dielectric constant was obtained by the ammonia treatment followed by light reoxidation in a wet ambient. We confirmed nitrogen incorporation in the tantalum oxynitride (TaO//xN//y) by Auger Electron Spectroscopy. By optimizing the nitridation and reoxidation process, we obtained an equivalent oxide thickness of less than 1.6nm and a leakage current of less than 10mA/cm**2 at -1.5V. Compared with NH//3 nitridation, nitridation of Ta//20//5 in ND//3 improve charge trapping and charge-to-breakdown characteristics of tantalum oxynitride. 9 Refs.

Descriptors: *Tantalum compounds; Dielectric materials; Gates (transistor); Annealing; Permittivity; Ammonia; Auger electron spectroscopy; Leakage currents; Nitriding; Optimization; MOS devices

Identifiers: Gate dielectrics; Tantalum oxynitride

Classification Codes:

804.1 (Organic Compounds); 708.1 (Dielectric Materials); 714.2 (Semiconductor Devices & Integrated Circuits); 537.1 (Heat Treatment Processes); 804.2 (Inorganic Compounds); 701.1 (Electricity, Basic Concepts & Phenomena); 921.5 (Optimization Techniques)

804 (Chemical Products Generally); 708 (Electric & Magnetic Materials); 714 (Electronic Components & Tubes); 537 (Heat Treatment); 701 (Electricity & Magnetism); 801 (Chemistry); 921 (Applied Mathematics)

80 (CHEMICAL ENGINEERING, GENERAL); 70 (ELECTRICAL ENGINEERING, GENERAL); 71 (ELECTRONICS & COMMUNICATION ENGINEERING); 53 (METALLURGICAL ENGINEERING, GENERAL); 92 (ENGINEERING MATHEMATICS)

2/9/9 (Item 2 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)

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04946349 E.I. No: EIP98024080813

Title: Characterization of self-patterned SrBi//2Ta//20//9 thin films from photo-sensitive solutions

Author: Uchida, H.; Soyama, N.; Kageyama, K.; Ogi, K.; Scott, M.C.; Cuchiario, J.D.; Derbenwick, G.F.; McMillan, L.D.; De Araujo, C.A. Paz

Corporate Source: Mitsubishi Materials Corp, Saitama, Jpn

Conference Title: Proceedings of the 1996 8th International Symposium on Integrated Ferroelectrics. Part 3 (of 3)

Conference Location: Tempe, AZ, USA Conference Date: 19960318-19960320

E.I. Conference No.: 47891

Source: Integrated Ferroelectrics v 16 n 1-4 pt 3 1997. p 41-52

Publication Year: 1997

CODEN: IFEREU ISSN: 1058-4587

Language: English

Document Type: JA; (Journal Article) Treatment: X; (Experimental)

Journal Announcement: 9804W3

Abstract: Self-patterned SrBi//2Ta//20//9 thin films were successfully fabricated from photo-sensitive solutions by means of UV irradiation through photo masks. After conventional baking and wet etching the films were annealed. The photo-sensitive SrBi//2Ta//20//9 solutions give high resolution negative-pattern of the mask image down to 1 mu m line width by deep UV irradiation at 900 mJ/cm**2. The capacitor characteristics of the 210 nm thick films fabricated on the Pt/Ti/SiO//2/Si substrates by this process showed 2Pr values of 17 mu C/cm**2, 2Ec of 89 kV/cm, and leakage current densities of 5 multiplied by 10** minus **9 A/cm**2 72 at 5 V. The films showed no fatigue after 1 multiplied by 10**1**1 switching cycles. (Author abstract) 9 Refs.

Descriptors: *Dielectric films; Bismuth compounds; Perovskite; Ultraviolet radiation; Etching; Annealing; Photosensitivity; Masks;

Capacitors; Substrates

Identifiers: Strontium Bismuth tantalum oxide

Classification Codes:

708.1 (Dielectric Materials); 804.2 (Inorganic Components); 741.1 (Light/Optics); 802.2 (Chemical Reactions); 537.1 (Heat Treatment Processes); 704.1 (Electric Components)

708 (Electric & Magnetic Materials); 804 (Chemical Products); 741 (Optics & Optical Devices); 802 (Chemical Apparatus & Plants); 537 (Heat Treatment); 704 (Electric Components & Equipment)

70 (ELECTRICAL ENGINEERING); 80 (CHEMICAL ENGINEERING); 74 (OPTICAL TECHNOLOGY); 53 (METALLURGICAL ENGINEERING)

2/9/10 (Item 3 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)

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02703650 E.I. Monthly No: EI8902015592

Title: Interfacial oxidation of silicon substrates through Ta//20//5 films.

Author: Kato, Takashi; Ito, Takashi

Corporate Source: Fujitsu Lab Ltd, Morinosato-Wakamiya, Jpn

Source: Journal of the Electrochemical Society v 135 n 10 Oct 1988 p 2586-2590

Publication Year: 1988

CODEN: JESOAN ISSN: 0013-4651

Language: English

Treatment: X; (Experimental)

Journal Announcement: 8902

Abstract: The authors observed the oxidation of a silicon substrate covered with thermally grown tantalum oxide films during exposure to a high-temperature oxidizing ambient. It was found that the oxidation rate of a silicon substrate covered with Ta//20//5 greatly depended on the oxidizing ambient. In a wet oxygen ambient, the oxidation rate was equal to that of bare silicon. However, the rate became very small in a dry oxygen ambient. The authors believe that these results can be attributed to the differences between the species that diffuse through the Ta//20//5, resulting in a diffusion coefficient over 4000 times larger in wet oxygen than that in dry oxygen at 1000 degree C. The silicon oxide grown at the interface is stoichiometric silicon dioxide and the transitions between the Ta//20//5/SiO//2/Si layers are very abrupt. (Edited author abstract) 21 Refs.

Descriptors: *SEMICONDUCTING SILICON--*Oxidation; TANTALUM COMPOUNDS--Thin Films; SEMICONDUCTOR DEVICES, MOS

Identifiers: INTERFACIAL OXIDATION; LATTICE IMAGES; ARRHENIUS EQUATION

Classification Codes:

712 (Electronic & Thermionic Materials); 804 (Chemical Products); 714 (Electronic Components)

71 (ELECTRONICS & COMMUNICATIONS); 80 (CHEMICAL ENGINEERING)

2/9/11 (Item 1 from file: 144)

DIALOG(R) File 144:Pascal

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14097707 PASCAL No.: 99-0291379

Electrochemical degradation of phenol in aqueous solution on bismuth doped lead dioxide : a comparison of the activities of various electrode formulations

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Journal: Journal of applied electrochemistry, 1999, 29 (3) 277-283

ISSN: 0021-891X CODEN: JAELEBJ Availability: INIST-15602;

354000083323230010

No. of Refs.: 28 ref.

Document Type: P (Serial) ; A (Analytic)

Country of Publication: United Kingdom

Language: English

This paper describes the development of electrochemical processes for the oxidative degradation of toxic organic chemicals in waste waters. Doped bismuth lead dioxide anodes have been tested by the kinetic study of phenol anodic oxidation in aqueous solution. The main products during oxidative degradation of phenol are 1,4-benzoquinone, maleic acid and carbon dioxide. Several deposits of $\text{Bi}_2\text{O}_5\text{-PbO}$ on $\text{Ti}/(\text{IrO}_2\text{-Ta}_2\text{O}_5)$ substrates have been prepared by anodic oxidation of Pb^{2+} and Bi^{3+} in aqueous solutions containing perchloric acid to increase the solubility of bismuth. To study the effect of perchlorate ions, the efficiency of the PbO deposit prepared from lead nitrate in an aqueous solution (pure PbO) was compared with that of deposit prepared from perchloric acid solution (perchlorate doped PbO). Although the phenol is oxidized at the same rate on the two deposits, the charge corresponding to the total elimination of 1,4-benzoquinone is three times higher for perchlorate doped PbO than for pure PbO . Phenol degradation is more efficiently carried out on a PbO anode doped with perchlorate and with bismuth than on the same electrode doped only with perchlorate. Among the electrodes tested in this work, the pure PbO anode is the most efficient for phenol degradation. It is assumed that certain active sites on the anode occupied by perchlorate ions do not participate in the transfer of oxygen atoms and that for the PbO electrode doped with bismuth, oxygen evolution is favoured to the detriment of oxygen atom transfer.

English Descriptors: Waste water purification; Electrochemical method; Oxidative degradation; Oxidation; Organic compounds; Aromatic compound; Phenol-ENT; Aqueous solution; Acidic solution; Electrodes; Lead IV Oxides-ACT; Doped materials; Bismuth

French Descriptors: Epuration eau usee; Methode electrochimique; Degradation oxydante; Oxydation; Compose organique; Compose aromatique; Phenol-ENT; Solution aqueuse; Solution acide; Electrode; Plomb IV Oxyde-ACT; Materiau dope; Bismuth

Classification Codes: 001D16A05A; 001C01H05

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2/9/12 (Item 2 from file: 144)

DIALOG(R) File 144:Pascal

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13659388 PASCAL No.: 98-0366673

En Japonais

(Wettability and friction coefficient of the oxide thin film surface)

OHWAKI T; TAGA Y

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Journal: Hyomen gijutsu, 1998, 49 (2) 191-194

ISSN: 0915-1869 Availability: INIST-1481; 354000075777460050

No. of Refs.: 14 ref.

Document Type: P (Serial) ; A (Analytic)

Country of Publication: Japan

Language: Japanese Summary Language: English

We sputter-deposited oxide thin films such as Y_2O_3 , SiO_2 , TiO_2 , Ta_2O_5 , CeO_2 , and MoO_3 and studied water droplet wettability and the surface friction coefficient under the controlled conditions of 20-25 Degree C and 50-60% RH. Water droplet wettability was evaluated by measuring the contact angle. We found that the angle increased and saturated over time for all tested oxide thin films and that contact angle saturation depended on the type of oxide thin films used. The relationship between the contact angle and r/Z (ion radius divided by cation charge) suggests that the oxide surface structure affects adsorption states. We also found that the thin film surface friction

coefficient also decreases over time in line with variation in the contact angle. The correspondence between the friction coefficient and adhesion derived from the contact angle means that friction originates in adhesive force.

English Descriptors: Thin films; Surface properties; Yttrium Oxides; Silicon Oxides; Titanium Oxides; Tantalum Oxides; Cerium Oxides; Molybdenum Oxides; Binary compound; Wettability; Hydrophobicity; Friction coefficient; Contact angle; Droplet; **Water**; Friction; Tribology; **Oxidation**; Mechanical properties; Oxide layer; Surface layer; Adhesivity

French Descriptors: Couche mince; Propriete surface; Yttrium Oxyde; Silicium Oxyde; Titane Oxyde; Tantale Oxyde; Cerium Oxyde; Molybdene Oxyde; Compose binaire; Mouillabilite; Hydrophobicite; Coefficient frottement; Angle contact; Gouttelette; Eau; Frottement; Tribologie; Oxydation; Propriete mecanique; Couche oxyde; Couche superficielle; Adhesivite; Y2O3; O Y; SiO2; O Si; Ta2O5; O Ta; CeO2; Ce O; MoO3; Mo O

Classification Codes: 001C01I03

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2/9/13 (Item 3 from file: 144)
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12125701 PASCAL No.: 95-0357413

Etude cinetique de l'oxydation thermique du tantale dans des atmospheres mixtes oxygene-vapeur d'eau

(Kinetics of the thermal oxidation of tantalum in oxygen- water vapour mixtures)

DE NICOLA M R; WOUTERS Y; GALERIE A; CAILLET M

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Journal: Journal de chimie physique, 1995, 92 (5) 1142-1153

ISSN: 0021-7689 CODEN: JCPBAN Availability: INIST-542;

354000050613700080

No. of Refs.: 15 ref.

Document Type: P (Serial) ; A (Analytic)

Country of Publication: France

Language: French Summary Language: English

L'oxydation thermique du tantale est etudiee entre 450 et 600 Degree C dans l'oxygene sec, la vapeur d'eau pure ou des melanges oxygene-vapeur d'eau. Dans ces trois conditions, le produit d'oxydation majoritaire est l'oxyde $Ta_{SUB 2}O_{SUB 5}$, presentant toujours une morphologie poreuse et stratifiee. Les cinetiques d'oxydation sont identiques dans leur allure generale (lineaire apres une courte periode initiale parabolique puis acceleree), mais presentent des vitesses differentes. Les influences de pression relevees a la temperature de 520 Degree C permettent d'appréhender la nature des processus limitants qui sont toujours de nature reactionnelle. Dans le cas particulier des melanges, la sorption dissociative de l'oxygene participe egalement a la limitation cinetique et conduit a une forme particuliere de la courbe vitesse/pression de $H_{SUB 2}O$

English Descriptors: Experimental study; Thermal reaction; Oxidation; Tantalum-ENT; Kinetic parameter; Rate constant; Adsorption site
Broad Descriptors: Uebergangsmetalle; Transition metal; Metal transition; Metal transicion

French Descriptors: Etude experimentale; Reaction thermique; Oxydation; Tantale-ENT; Parametre cinetique; Constante vitesse; Site adsorption

Classification Codes: 001C02A

2/9/14 (Item 4 from file: 144)
DIALOG(R) File 144:Pascal
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08408958 PASCAL No.: 88-0409745

Pulsed ruby laser-induced aqueous oxidation of tantalum: X-ray diffraction and x-ray photoelectron spectroscopic study

(Oxydation aqueuse du tantale induite par laser pulse: etude par spectroscopie photoelectronique RX et diffraction des RX)

GHAISAS S V; MALSHE A P; PATIL P P; KANETKAR S M; OGALE S B; Bhide V G

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Journal: Journal of applied Physics, 1987, 62 (7) 2799-2802

ISSN: 0021-8979 Availability: CNRS-126

No. of Refs.: 19 ref.

Document Type: P (Serial) ; A (Analytic)

Country of Publication: USA

Language: ENGLISH

Analyse de la morphologie superficielle et des etats chimiques et structuraux des phases d'oxydes synthetises par trempe reactive induite par laser a l'interface eau-tantale

English Descriptors: **Oxidation** ; Tantalum; **Tantalum oxide** ; Laser; Experimental study; Interface; **Water** ; Microstructure; Morphology; Photoelectron spectrometry; X ray diffraction; Scanning electron microscopy

French Descriptors: Oxydation; Tantale; Tantale oxyde; Laser; Etude experimentale; Interface; Eau; Microstructure; Morphologie; Spectrometrie photoelectron; Diffraction RX; Microscopie electronique balayage; Metal pur Ta